PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for April, 1890, as determined from the reports of nearly 2,000 stations, is exhibited on chart iii. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The heaviest monthly precipitation reported for April, 1890, was 16.85, at Columbia, Caldwell Parish, La., and the monthly precipitation exceeded ten inches in west-central and southwestern Arkansas, and thence south of west over Texas to the one hundredth meridian, in a small area in Texas north of Galveston, in west-central Mississippi, and at Dunsmuir, Siskiyou Co., Cal. The monthly precipitation equalled, or exceeded, five inches in areas in eastern Connecticut, west-central Pennsylvania, extreme western Virginia, extreme western North Carolina, north-central Georgia, northwestern Alabama, western and central Mississippi, eastern and southern Louisiana, in Texas east of the one hundredth meridian, generally over Arkansas, in central and southern Indian Territory, eastern and western Tennessee, eastern Kentucky, southwestern Illinois, south-central and north-central Indiana, northwestern Ohio, extreme western New York, southeastern Michigan, north-central Iowa, southeastern Missouri, western Kansas, southwestern Nebraska, southeastern Wyoming, in Siskiyou county, north-central California, and in northwestern Washington. In areas in southwestern Arizona, southern California, southwestern Idaho, northeastern Montana, western Nevada, extreme western Texas, and central Utah no precipitation was reported, and in areas in central and north-central Florida, southern Georgia, southern Alabama, northwestern Missouri, southwestern Iowa, northeastern Nebraska, northeastern South Dakota, eastern and southeastern South Dakota, southwestern Wisconsin, western Minnesota, north-central Kansas, northern New Mexico, northwestern Colorado, southern Wyoming, and eastern Oregon and Washington, less than one-half inch of precipitation was reported.

The precipitation was in excess of the average for the month along the eastern slope of the Rocky Mountains south of the forty-fifth parallel, in the west Gulf states and thence northeastward over southern Missouri, the northern part of the Ohio Valley, and the eastern part of the upper lake region, at several stations along the south New England and middle Atlantic coasts, in southeastern Arizona, and on the extreme north Pacific coast; elsewhere the precipitation was deficient. The greatest excesses in precipitation occurred in south-central Indian Territory and thence southward to central Texas, where they were more than six inches, and at one station in south-central Louisiana, Grand Coteau, with seven years record, an excess of 6.39 was reported. At Brownsville, Tex., and Logansport, Ind., the rainfall exceeded the April average by more than four inches, and over northeastern lower Michigan, and adjoining parts of Nebraska, Wyoming, and Colorado, the precipitation was more than two inches in excess of the average. The greatest deficiencies in precipitation occurred in central Alabama, where they exceeded four inches, and the deficiency was more than two inches over the southern part of the east Gulf states, and in the lower valley of the Red River of the North. Considered by districts the average percentages of the normal precipitation in districts where the precipitation was in excess were about as follows: Rio Grande Valley, 335 per cent.; southeastern slope of the Rocky Mountains, 301 per cent.; southern plateau region, 192 per cent.; west Gulf states, 144 per cent.; lower lake region and northeastern slope of the Rocky Mountains, 128 per cent.; middle-eastern slope of the Rocky Mountains, 127 per cent.; and upper lake region, 109 per cent. In districts where the monthly precipitation was deficient the percentages of the normal were about as follows: south Pacific coast, 9 per cent.; northern plateau region, 26 per cent.; extreme northwest, 48 per cent.; east Gulf states, 51 per cent.; middle Pacific coast, 53 per cent.; middle plateau region, 57 per cent.; south Atlantic coast, 59 per cent.; Missouri Valley, 63 per cent.; upper Mississippi valley, 75 per cent.; north Pacific coast, 79 per cent.; Key West, Fla., 83 per cent.; middle Atlantic states, 88 per cent.; New England, 90 per cent.; and the Ohio Valley and Tennessee, 97 per cent. In the Rio Grande Valley and on the southeastern slope of the Rocky Mountains more than three times the usual amount of rain fell; over the southern plateau region nearly double the average amount; and in the west Gulf states the monthly precipitation was about one-half greater than the average for April. On the south Pacific coast the monthly precipitation was one-tenth; over the northern plateau region about one-fourth; and in the south Atlantic and east Gulf states, the extreme northwest, the middle plateau region, and the middle Pacific coast about one-half the usual amount for April.

The table of miscellaneous meteorological data for regular stations of the Signal Service and the table of deviations from the normal precipitation for certain stations, as reported by voluntary observers, show that at the following-named places the precipitation for the current month was the heaviest ever noted for April during the respective periods of observation: Grand Coteau, La.; Brownsville, Tex.; Wauseon, Ohio; Logansport, Ind.; Cheyenne, Wyo.; Colorado Springs, Colo.; Fort Sill, Ind. T.; Abilene, Tex.; Santa Fé, N. Mex.; Fort Bowie, Fort Grant, Fort Thomas, San Carlos, and Wilcox, Ariz. At Moorhead, Minn.; Huron, S. Dak.; Fort Assiniboine, Mont.; Keeler, Cal.; Walla Walla, Wash., and San Diego, Cal., the monthly precipitation was the least ever reported for April during the respective periods of observation.

In April of preceding years the heaviest precipitation was generally noted in the middle Atlantic states in 1874 or 1889; in the lower lake region and along the middle Pacific coast in 1880; on the southeastern slope of the Rocky Mountains in 1888; and on the north Pacific coast in 1883 or 1887; elsewhere the periods of heaviest rainfall in April were irregular. The least precipitation for April was generally reported in southern New England, the south Atlantic states, and along the middle Pacific coast in 1888; in the west Gulf states in 1887; in the Ohio Valley and Tennessee in 1888 or 1889, and over the northern plateau region and along the north Pacific coast in 1885; elsewhere the periods of least precipitation for April were irregular.

For the period January to April, 1890, inclusive, the greatest excesses in precipitation occurred on the southeastern slope of the Rocky Mountains where the rainfall was more than one-half greater, and in the west Gulf states, the Ohio Valley and Tennessee, and along the north Pacific coast where it was more than one-fourth greater than the average; the most marked deficiencies were noted in the south Atlantic and east Gulf states and the Florida Peninsula, where about one-half the usual amount of precipitation for the period named was reported.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for April for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for April, 1890; (4) the departure of the current month from the average; (5) and the extreme monthly precipitation for April during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of April.	(2) Length of record.	(3) Total for April, 1890.	(4) Departure from average.	(5) Extreme monthly precipitation for April.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.		*Inches*	*Years*	*Inches*	*Inches.*	*Inches*		*Inches.*	
Lead Hill	Boone	3.96	8	5.71	+1.75	6.61	1882	1.57	1889
California.									
Sacramento	Sacramento	1.87	40	1.34	−0.53	14.20	1880	T.	1875
Connecticut.									
Middletown	Middlesex	3.35	28	2.84	−0.51	7.16	1874	1.48	1882
Florida.									
Merritt's Island	Brevard	4.26	12	0.78	−3.48	9.74	1878	0.53	1885
Georgia.									
Forsyth	Monroe	4.34	16	1.80	−2.54	9.59	1883	0.55	1888
Illinois.									
Peoria	Peoria	3.07	34	2.33	−0.74	6.25	1858	0.45	1870
Riley	McHenry	2.92	39	2.88	−0.04	6.20	1868	0.60	1854
Indiana.									
Logansport	Cass	3.11	15	7.17	+4.06	7.17	1890	0.85	1857
Vevay	Switzerland	3.48	25	4.33	+0.85	7.18	1872	0.92	1889
Iowa.									
Cresco	Howard	2.17	18	1.64	−0.53	3.68	1888	1.11	1883
Monticello	Jones	2.57	34	2.09	−0.48	5.78	1862	0.63	1863
Logan	Harrison	2.71	23	2.17	−0.54	5.44	1888	0.40	1870
Kansas.									
Lawrence	Douglas	3.23	23	2.51	−0.72	5.72	1885	1.08	1870
Louisiana.									
Grand Coteau	St. Landry	4.25	7	10.64	+6.39	10.64	1890	1.77	1887
Maine.									
Orono	Penobscot	2.95	20	2.02	−0.93	5.08	1887	1.28	1881
Maryland.									
Cumberland	Allegany	2.39	18	3.58	+0.19	6.50	1874	0.60	1879
Massachusetts.									
Amherst	Hampshire	3.19	54	1.67	−1.52	8.33	1854	0.57	1844
Newburyport	Essex	3.24	10	1.78	−1.46	4.99	1887	1.78	1890
Somerset	Bristol	3.87	17	3.83	−0.04	7.72	1874	1.52	1881
Michigan.									
Kalamazoo	Kalamazoo	2.51	14	3.40	+0.89	8.00	1880	0.92	1876
Thornville	Lapeer	2.30	13	3.35	+1.05	6.13	1880	1.34	1889
Minnesota.									
Minneapolis	Hennepin	2.42	22	1.75	−0.67	5.12	1888	0.53	1881
Montana.									
Fort Shaw	Lewis&Clarke	0.67	19	0.06	−0.61	2.30	1886	0.04	1875
New Hampshire.									
Hanover	Grafton	2.39	47	1.57	−0.82	6.00	1840	0.38	1872
New Jersey.									
Moorestown	Burlington	2.94	26	2.14	−0.80	8.40	1874	0.67	1881
South Orange	Essex	3.22	19	2.43	−0.79	7.54	1889	0.85	1881
New York.									
Cooperstown	Otsego	2.94	36	2.86	−0.08	7.12	1854	0.92	1863
Palermo	Oswego	2.37	36	2.00	−0.37	7.00	1859	0.26	1879
North Carolina.									
Lenoir	Caldwell	3.62	18	3.40	−0.22	7.80	1874	1.30	*
Ohio.									
N. Lewisburgh	Champaign	2.77	18	2.55	−0.22	6.45	1880	0.63	1879
Wauseon	Fulton	2.41	17	5.29	+2.88	5.29	1890	1.31	1872
Oregon.									
Albany	Linn	3.50	13	1.77	−1.73	6.53	1883	1.38	1885
Eola	Polk	2.74	19	1.00	−1.74	6.50	1883	0.89	1888
Pennsylvania.									
Dyberry	Wayne	2.48	21	2.53	+0.05	5.07	1874	0.80	1882
Grampian Hills	Clearfield	3.50	19	3.39	−0.11	6.11	1874	1.35	1870
Wellsborough	Tioga	5.08	11	4.03	−1.05	10.77	1886	1.54	1881
South Carolina.									
Statesburgh	Sumter	2.37	9	2.73	+0.36	4.17	1883	0.83	1888
Tennessee.									
Austin	Wilson	4.87	22	4.39	−0.48	11.98	1877	1.79	1876
Milan	Gibson	4.00	7	5.34	+1.34	9.58	1883	1.01	1889
Texas.									
New Ulm	Austin	3.81	17	6.37	+2.56	8.00	1873	0.17	1887
Vermont.									
Strafford	Orange	2.79	17	2.10	−0.69	12.20	1874	0.60	†
Virginia.									
Birdsnest	Northampton	3.59	21	4.50	+0.91	11.25	1889	1.10	1869
Wisconsin.									
Madison	Dane	4.63	21	2.22	−2.41	5.49	1861	0.96	1887
Washington.									
Fort Townsend	Jefferson	1.58	14	0.90	−0.68	2.98	1883	0.38	1877

*1876 and 1885; †1873 and 1881.

EXCESSIVE PRECIPITATION.

Monthly precipitation to equal or exceed ten inches for April, 1890, was reported at ten stations in Louisiana, at eight stations in Texas, at four stations in Arkansas, and at one station each in Mississippi and Indian Territory. Among the heavier rainfalls for the month were, 16.85, at Columbia, La.; 15.00, at Dardanelle, Ark.; and 13.60, at Gainesville, Tex. In April of preceding years precipitation to equal or exceed ten inches has been reported for twelve years in Louisiana and Mississippi; for eleven years in Alabama; for ten years in Arkansas; for from five to nine years, inclusive, in California, Georgia, Illinois, New York, North Carolina, Ohio, Tennessee, and Texas; and for from one to four years, inclusive, in Colorado, Connecticut, Florida, Indiana, Indian Territory, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Missouri, Nebraska, New Hampshire, New Jersey, Oregon, Pennsylvania, Rhode Island, South Carolina, Virginia, Vermont, Washington, and Wisconsin. In states and territories other than those named, precipitation to equal or exceed ten inches has not been reported for April of preceding years. Among the heavier rainfalls reported for April of preceding years were: 30.40, at Summit, Cal., in 1880; 23.80, at Jackson, Miss., in 1874; 23.60, at Paulding and Fellowship, Miss., in 1871; 23.41, at Mount Washington, N. H., in 1878; 21.76, at Emigrant Gap, Cal., in 1880; 21.20, at Newport Ark., in 1886; 20.35, at Brook Haven, Miss., in 1876. Exclusive of the instances and years cited, precipitation to equal or exceed fifteen inches in April has been reported for three years in Louisiana and Texas; for two years in Alabama, Arkansas, and Mississippi; and for one year in California, Georgia, Missouri, New York, North Carolina, South Carolina, and Tennessee.

For the current month precipitation to equal or exceed 2.50 inches in twenty-four hours was reported at twenty-one stations in Louisiana, and on seven dates, the 1st, 2d, 3d, 21st, 22d, 23d, and 26th; at thirteen stations in Texas, and on nine dates, the 1st, 2d, 17th, 18th, 21st, 22d, 23d, 24th, and 25th; at twelve stations in Arkansas, and on eight dates, the 2d, 3d, 14th, 15th, 16th, 24th, 25th, and 26th; at six stations in Mississippi, and on four dates, the 3d, 22d, 23d, and 24th; at five stations in Indiana, on the 25th and 26th; at three stations in Indian Territory, and on three dates, the 24th, 25th, and 26th; at two stations in Kansas, and on three dates, the 19th, 23d, and 24th; at two stations in Pennsylvania, on the 8th and 9th; at one station in California, on the 5th; at one station in Georgia, on the 3d; at one station in Illinois, on the 25th; and at one station in Nebraska, on the 21st. Among the heavier rainfalls reported for this period were: 7.00, at Shell Beach, La., on the 21st; 6.20 at Dardanelle, Ark., 15–16th; 5.60, at Colorado, Tex., 23d; 4.25, at Fayette, Miss., 22–23d; 4.50, at Marengo, Ind., 25th; and 4.14, at Mount Vernon *a*, Ind., 26th. In April of preceding years precipitation to equal or exceed 2.50 inches in twenty-four hours has been reported for thirteen years in Alabama and Tennessee; for twelve years in Arkansas, Georgia, Louisiana, Mississippi, and Texas; for eleven years in North Carolina; for from five to nine years, inclusive, in the Dakotas, Florida, Illinois, Indiana, Indian Territory, Iowa, Kansas, Kentucky, and Missouri; and for from one to four years, inclusive, in California, Colorado, Connecticut, District of Columbia, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Virginia, Vermont, Wisconsin, and Wyoming. In states and territories other than these named precipitation to equal or exceed 2.50 inches for the period given has not been reported for April of preceding years. Among the heavier rainfalls reported for this period for April of preceding years were: 12.28 at Point Pleasant, La., 5th, 1885; Fort Smith, Ark., 11.00, 23d, 1879; Mobile, Ala., 7.30, 19th, 1882. Exclusive of the years and instances cited, precipitation to equal or exceed five inches in twenty-four hours has been reported for three years in Texas; for two years in Alabama, Kansas, and Louisiana; and for one year in Arkansas, California, District of Columbia, Georgia, Illinois, Indiana, Indian Territory, Maryland, Pennsylvania, South Carolina, and Utah.

For the current month precipitation to equal or exceed one inch in one hour was reported at three stations in New Jersey, and on two dates, the 7th and 27th; at three stations in Texas, and on two dates, the 17th and 24th; at one station in Iowa, on the 7th; at one station in Louisiana, on the 17th; at one station in Missouri, on the 3d; and at one station in Arkansas, on the 14th. Among the heavier rainfalls reported for this period were: 1.70 inch in forty-eight minutes, at New Orleans, La., on the 17th; 1.39 inch in fifteen minutes, at Egg Harbor City, N. J., on the 27th; and 2.04 inches in forty-five minutes, at Conway, Ark., on the 14th. In April of preceding years precipitation to equal or exceed one inch in one hour has been reported for eight years in Texas, and for from one to five years, inclusive, in Alabama, Arkansas, the Dakotas, Florida,

Georgia, Illinois, Iowa, Kansas, Louisiana, Maryland, Michigan, Mississippi, Nebraska, North Carolina, Pennsylvania, South Carolina, and Tennessee. In states and territories other than those named precipitation to equal or exceed one inch in one hour has not been reported for April. Among the heavier rainfalls reported for this period in April of preceding years were: 1.50 in twenty minutes, at Jacksonville, Fla., 23d, 1883; 1.78 in twenty-five minutes, at Titusville, Fla., 19th, 1888; 2.00 in thirty minutes, at Cabaniss, Ga., 1st, 1874; 1.12 in twelve minutes, at Atlanta, Ga., 24th, 1889; 1.50 in ten minutes, at Adrian, Mich., 5th, 1888; 3.00 in forty-five minutes, at Pilot Point, Tex., 28th, 1879.

Table of excessive precipitation, April, 1890.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Arkansas.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Arkansas City		2.71	24			
Conway		3.00	14	2.04	0 45	14
Dardanelle	15.00	3.45	2			
		6.20	15-16			
Fulton	10.22	3.29	3			
Hot Springs	12.95	4.31	2			
		3.10	25			
Little Rock		3.08	2			
Little Rock Barracks		2.65	3			
Newport(1)	10.41	2.76	3			
Lonoke		2.50	26			
		5.00	3			
Ozone		3.44	2			
Stuttgart		2.50	14			
California.						
Upper Mattole		2.77	6			
Georgia.						
Diamond		3.50	3			
Illinois.						
Mascoutah		3.70	25			
Indiana.						
De Gonia Springs		2.71	25-26			
Huntingburgh		3.00	25			
Marengo		4.50	25			
Mount Vernon		4.14	25			
New Providence		2.50	26			
Indian Territory.						
Fort Sill		3.56	24-25			
Healdton	10.39	2.67	25			
Mount Vernon(1)		4.14	26			
Iowa.						
Eagle Grove				1.00	1 00	7
Kansas.						
Collyer		3.00	19			
Richfield		3.38	23-24			
Louisiana.						
Alexandria	10.55	2.91	3			
Amité City		6.57	22-23			
Cameron		2.90	2			
Cheneyville	13.15	2.95	23			
Clinton		4.15	23			
Columbia	16.85	3.00	1			
		5.75	3			
Coushatta(1)	10.75	2.50	2			
Crowley		2.71	3			
		3.39	22			
Emilie		2.52	22			
Girard		3.80	3			
Grand Coteau	10.64	3.39	26			
Hammond	11.16	4.39	22			
		4.62	23			
Jeanerette	11.16	4.75	21			
		4.45	22			
Lake Charles		3.00	3			
Marksville	13.56	6.25	22			
Maurepas		4.00	23			
Melville	12.45	4.31	2			
Monroe		3.33	3			
New Orleans				1.70	0 48	17
Paincourtville		2.85	23			
Plaquemine		4.21	22			
Shell Beach	12.25	2.50	3			
		7.00	21			
Mississippi.						
Fayette		4.25	22-23			
Greenville	11.01	4.10	24			
Natchez		3.01	23			
Summit		3.20	22			
Washington		3.57	23			
Waynesborough(1)		2.84	3			
Missouri.						
Steelville				1.05	1 00	3
Nebraska.						
North Platte		2.84	21			
New Jersey.						
Atlantic City				1.95	1 55	27
Egg Harbor City				1.39	0 15	27
Freehold				1.09	0 40	7
Pennsylvania.						
Altoona		3.13	9			
Wellsborough		2.76	8			

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Texas.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Abilene		2.82	23-24			
Brownsville		3.46	17-18	1.45	1 00	17
Brownwood				1.09	1 00	24
Caddo Peak		2.93	25			
Colorado	10.21	5.60	23			
Columbia		2.75	21			
Forestburgh	11.12	4.69	24-25			
Gainesville	13.60	5.40	24			
Graham	10.16					
Haskell		2.74	22			
Houston	10.59	4.75	2			
		3.76	21			
Howe	10.34					
Longview		2.90	2			
Mountain Springs	10.22					
New Braunfels		3.03	23			
Palestine				1.06	0 55	24
Pike	12.15	3.40	1-2			
		2.80	23			
Tyler		4.00?	25			

Received too late for publication in March Review.

California.						
Placerville, (2)	12.94					
Sandwich Islands.						
Honolulu	10.59	3.53	8			
Colony Surinam. S. A.						
Burnside-Coronie		3.90	10			

Received too late for general discussion of weather, April, 1890.

Arkansas.						
Conway	12.18					
Dallas	11.55					
Lonoke	11.88					
Ozone	12.83					
Washington	10.34					
California.						
Dunsmuir	11.85					

MAXIMUM RAINFALLS IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfalls during April, 1890, for periods of five and ten minutes and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Bismarck, N. Dak.			0.05	22	0.25	22
Boston, Mass			0.10	27	0.28	27
Buffalo, N. Y.	0.25	9	0.35	9	0.45	9
Cincinnati, Ohio			0.10	26	0.16	26
Chicago, Ill *						
Cleveland, Ohio					0.15	8
Detroit, Mich. †						
Denver, Colo					0.20	30
Galveston, Tex	0.15	21	0.25	21	0.75	21
Jupiter, Fla	0.20	21	0.25	21	0.35	21
Marquette, Mich *					0.12	10
New York City			0.09	4	0.19	4
New Orleans, La.	0.25	17	0.53	17	1.75	17
Norfolk, Va.	0.05	7	0.09	7	0.24	7
Philadelphia, Pa *						
Savannah, Ga	0.15	28	0.25	28	0.50	28
Saint Paul, Minn			0.05	8	0.25	8
San Francisco, Cal			0.06	18	0.28	18
Santa Fé, N. Mex *					0.15	15
Saint Louis, Mo *						
Washington City	0.15	4	0.15	4	0.25	9

* Record incomplete. † No record.

SNOW (snowfall in inches and tenths.)

The greatest depth of snowfall was reported at the more elevated stations in west-central Colorado, where it exceeded forty inches; in extreme southwestern Nebraska fifteen inches were reported; along the line of the Central Pacific Railroad in eastern California and in extreme east-central Nevada more than twenty-five inches of snow fell; and in extreme southeastern Wyoming more than twenty inches were reported. In extreme east-central Arizona, extreme west-central Kansas,

northeastern lower Michigan, extreme eastern upper Michigan, and southwestern South Dakota more than ten inches fell; and in central Maine, southeastern Massachusetts, central New Hampshire and Vermont, and extreme northwestern Oregon, more than five inches fell. In the Atlantic coast states appreciable snowfall was reported as far south as southern Virginia; in the Ohio Valley to southern Ohio; in the upper lake region to the southern shore of Lake Michigan; in the upper Mississippi valley to southeastern Minnesota; on the eastern slope of the Rocky Mountains to the northern part of the Panhandle of Texas; in the plateau region to extreme southeastern Arizona; and on the Pacific coast southwestward in western Oregon to about the forty-fourth parallel.

Snowfall of five inches, or more, was reported as follows, and in states and territories where the maximum depth was less than that amount, the station reporting the greatest is given: *Arizona.*—Cooley Springs, 14; Show Low, 10. *California.*—Summit, 26; Cisco, 15; Emigrant Gap, 14. *Colorado.*—Alma, 43.5; Fraser, 35; Boulder Cañon, 32; Agate and Durango, 30; Ranch, near Como, 26.3; Box Elder, 25; Monte Vista, 24; Breckenridge, 21.5; West Cliff, 19; Abbott, 16; San Luis Experimental Station, 15.5; Yuma and Peyton, 15; Eagle Farm, 14; Colorado Springs, 13.8; Kirk, 13.5; Georgetown, 12.5; Brush, Deer Trail, and Fort Morgan, 12; Cañon City, 11.5; Hardin, 11.2; Aroya and Wray, 10; Sanborn, 9.1; Carlisle and Thon, 9; Beaver Creek, 8.9; Bennet, Denver, and Watervale, 7; Apishapa, Delta, and Husted, 6; Fort Crawford, and Sunnyside, 5.3; Cheyenne Wells, Kit Carson, and Leadville, 5. *Connecticut.*—Southington, Wallingford, and Waterbury, 3. *Idaho.*—Era, 1. *Indiana.*—Point Isabel, 0.8. *Kansas.*—Weskan, 12; Grainfield and Tribune, 7.5; Leoti and Winona, 7; Lakin and Oakley, 6; Monument and Shields, 5. *Kentucky.*—Newport Barracks, trace. *Maine.*—Mayfield, 7; Farmington, 6.5; Cornish and Orono, 6; West Jonesport, 5; *Massachusetts.*—Cotuit, 6. *Michigan.*—Fort Brady, 12.9; Roscommon, 10; Grayling, 9; Crystal Falls, 8.5; Alpena, 6.9; Caldwell and Ivan, 6. *Minnesota.*—Duluth, 1.5. *Montana.*—Blackfeet Agency, 3.5. *Nebraska.*—Kimball, 15?; Hay Springs, 7.5. *Nevada.*—Ruby Hill, 26. *New Hampshire.*—Plymouth, 6; Berlin Mills and West Milan, 5. *New Jersey.*—Egg Harbor City, 1. *New Mexico.*—Santa Fé, 4.5. *New York.*—Fort Wadsworth, 3. *North Dakota.*—Fort Buford, 3.5. *Ohio.*—Carrolton and Columbus, 2. *Oregon.*—Vernonia, 7.5. *Pennsylvania.*—Mauch Chunk, 3. *Rhode Island.*—Kingston and Lonsdale, 3. *South Dakota.*—Spearfish, 10.5; Oelrich, 8; Fort Meade, 7.1. *Texas.*—Ochiltree, 3. *Vermont.*—Chelsea, 6. *Virginia.*—Woodstock, 2. *Washington.*—Fort Townsend, 1. *West Virginia.*—Mount Alto and Seven Pines, 3. *Wisconsin.*—Summit Lake 0.5. *Wyoming.*—Cheyenne, 22; Fort D. A. Russell 12.

DEPTH OF SNOW ON GROUND AT CLOSE OF MONTH.

Chart iv shows the depth of snow reported on the ground at the close of the month. In the north-central part of upper Michigan one-half inch of snow was reported; in central-lower Michigan two-tenths inch, and in central Vermont, trace. No reports of snow on the ground at the close of the month have been received from other sections of the country. At the close of March, 1890, snow was generally reported on the ground north of the thirty-seventh parallel and east of Arizona, in the middle plateau region, on the northeastern slope of the Rocky Mountains, and over the eastern part of the upper plateau region.

HAIL.

Description of the more severe hail storms of the month are given under the heading "Local storms." Hail was reported as follows: 1st, Ariz., Colo., Tex. 2d, La., Tex. 3d, Ill. 4th, Md., N. Y., Ohio, Wash. 6th, Ill., Iowa, Mo., Oregon, Va., Wash. 7th, Ill., Ind., Iowa, Minn., Pa., Wash., Wis. 8th, Conn., Ill., Ind., Iowa, Ky., Mass., Mich., N. Mex., N. Y., Ohio, Pa., Wis. 9th, Ala., Conn., Ill., Ind., Iowa, Ky., Md., Mich., N. J., N. Y., N. C., Ohio, Pa., Va. 10th, Iowa, N. Y., N. C., Ohio, Pa., Va., Wash., W. Va. 11th, Oregon, Wash. 12th, Ohio, Oregon, Wash., Wis. 13th, Ill., Iowa, Mo. 14th, Iowa, Miss. 15th, Ohio, S. C. 16th, Ariz. 17th, Wash., W. Va. 18th, Cal., N. Mex. 19th, Ariz., Colo., Iowa, N. C., Tex., Wyo. 20th, Colo., Iowa, N. Mex., N. C., Tex., Utah. 21st, Colo., Nebr., N. C. 22d, Kans., Minn., N. C., Tenn. 23d, Ariz., Kans., Ohio. 24th, Ariz., Ind. T., Tex. 25th, Iowa, La., Mass., N. Mex., Tex. 26th, Conn., La., N. Y., Ohio, Tenn., Tex. 27th, Colo., Ga., Iowa, Md., N. J., N. Y., N. C., Tenn., Va. 28th, Colo., Fla., N. C. 29th, Colo., Ohio. 30th, Ark., Idaho, Iowa, Mich., Tex.

SLEET.

Sleet was reported as follows: 1st, Ariz., Colo., Kans., N. Mex., Vt. 2d, Colo., Kans. 4th, N. Y. 5th and 7th, Vt. 8th, Conn., N. Y., Ohio, Pa. 9th, Ill., Ind., Ky., Mich., Pa. 10th, Ohio, W. Va. 11th, Oregon. 12th, Kans., Wash. 13th, Iowa. 14th, Ohio. 15th, N. Mex., Ohio. 16th, Va. 17th, Vt. 18th, N. Mex. 19th, Colo. 21st, Wyo. 22d, Minn. 24th, Nebr. 25th, Mass., N. H. 26th, Conn., Mass., N. Y., Pa., Vt. 27th, Vt.

WINDS.

The prevailing winds during April, 1890, are shown on chart ii by arrows flying with the wind. In New England, the middle and northern plateau regions, and the middle and northern Pacific coasts the winds were mostly from northwest to southwest; in the middle Atlantic states from south to northwest; in the south Atlantic states and on the southeastern slope of the Rocky Mountains from south to southwest; in Florida from east to southeast; in the east Gulf states, Tennessee, and the upper Mississippi valley from southeast to southwest; in the west Gulf states from southeast to south; in the Rio Grande Valley from the southeast; at Lake Ontario stations from west to southwest; at Lake Erie stations from north to east; in the Missouri Valley and on the middle-eastern slope of the Rocky Mountains from south to east; over the southern plateau region from south to west; along the south Pacific coast from west to northwest; and in the Ohio Valley, the upper lake region, the extreme northwest, and the northeastern slope of the Rocky Mountains, variable.

HIGH WINDS (in miles per hour).

Maximum velocities of fifty miles, or more, per hour were reported at regular stations of the Signal Service as follows: 3d, 50, s., at Saint Louis, Mo. 6th, 51, se., at Fort Canby, Wash. 7th, 60, sw., at Winnemucca, Nev.; 70, se., at Fort Canby, Wash. 8th, 60, nw., at North Platte, Nebr.; 56, nw., at Cheyenne, Wyo.; 50, nw., at Bismarck, N. Dak.; 54, n., at Valentine, Nebr.; 60, n., at Rapid City, S. Dak.; 54, n., at Dodge City, Kans.; and 54, n., at Fort Elliott, Tex. 9th, 52, w., at Columbus, Ohio; and 53, sw., at Buffalo, N. Y. 10th, 63, w., at Fort Assiniuiboine, Mont. 11th, 54, ne., at Fort Sully, S. Dak.; 52, sw., at Chicago, Ill. 12th, 56, sw., at Chicago, Ill. 17th, 56, se., at Fort Canby, Wash.

LOCAL STORMS.

On the 2d heavy rain injured crops and caused washouts on railroads at Palestine, Tex. On the 8th severe storms occurred in Illinois, Ohio, Iowa, and Michigan; wind storms prevailed in Wyoming, Nebraska, North Dakota, South Dakota, Kansas, and northern Texas, and a heavy storm was reported on the lower lakes. The report of the Ohio Meteorological Bureau states that severe tornadoes visited Huron, Medina, and Summit counties, Ohio, at 6 p. m., 8th. The Huron county storm pursued a course a little north of east, passing through Norwalk, East Townsend, and Wakeman, after which it moved to the